

SWRv Calculations

Example #1

1150 50th PI NE

Renovation planned for
interior of entire building

Building area: 37,250
square feet

SWR_v = ?



$$SWRv(cf) = \frac{P}{12 \text{ in/ft}} \times [0.95 \times (\text{Impervious Area}) + 0.25 \times (\text{Compacted Area})]$$

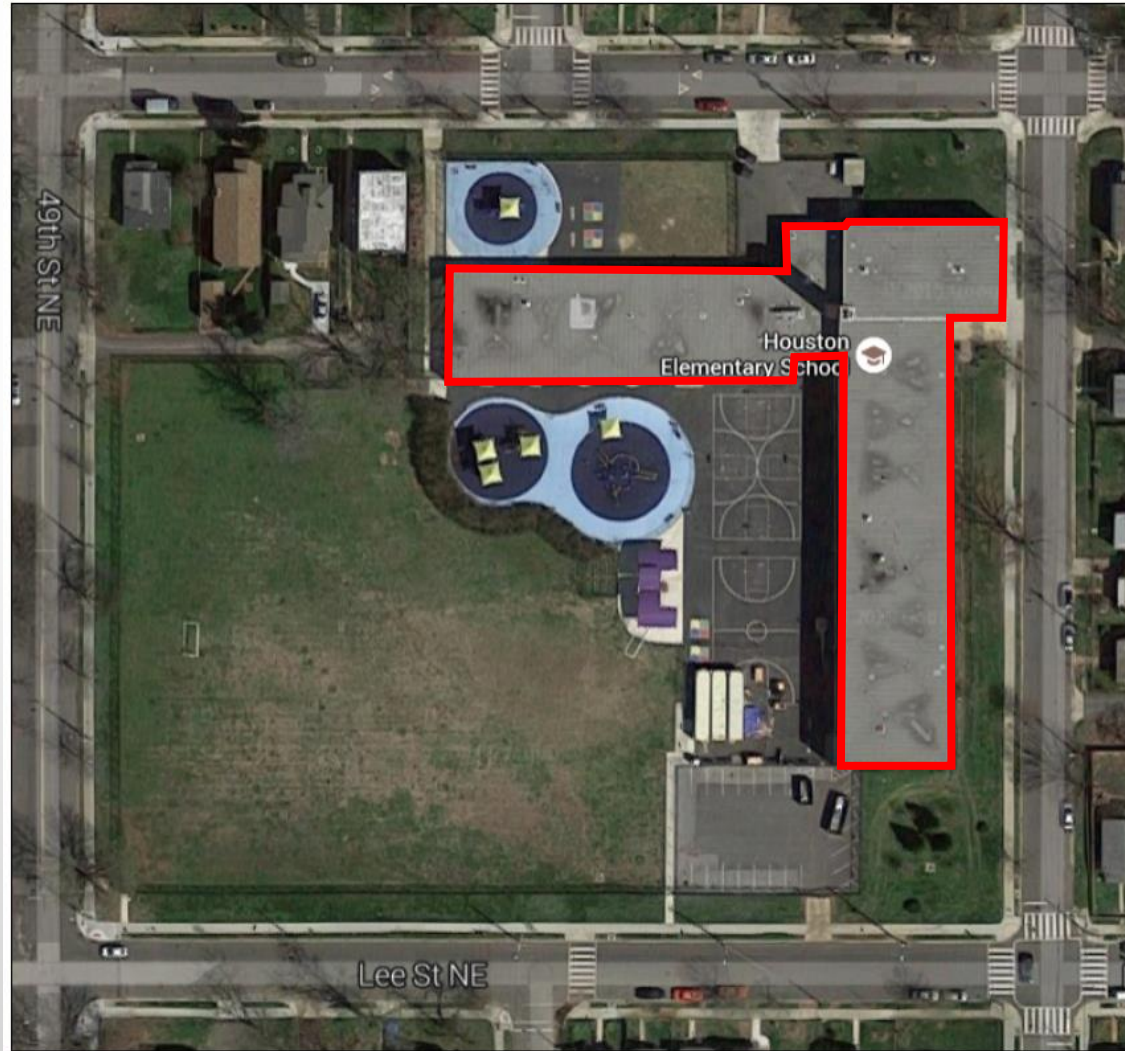
Example #1

1150 50th PI NE

Renovation planned for
interior of entire building

Building area: 37,250
square feet

SWRv = ?



$$SWRv(cf) = \frac{0.8 \text{ in}}{12 \frac{\text{in}}{\text{ft}}} \times [0.95 \times (37,250 \text{ ft}^2) + 0.25 \times (0 \text{ ft}^2)]$$

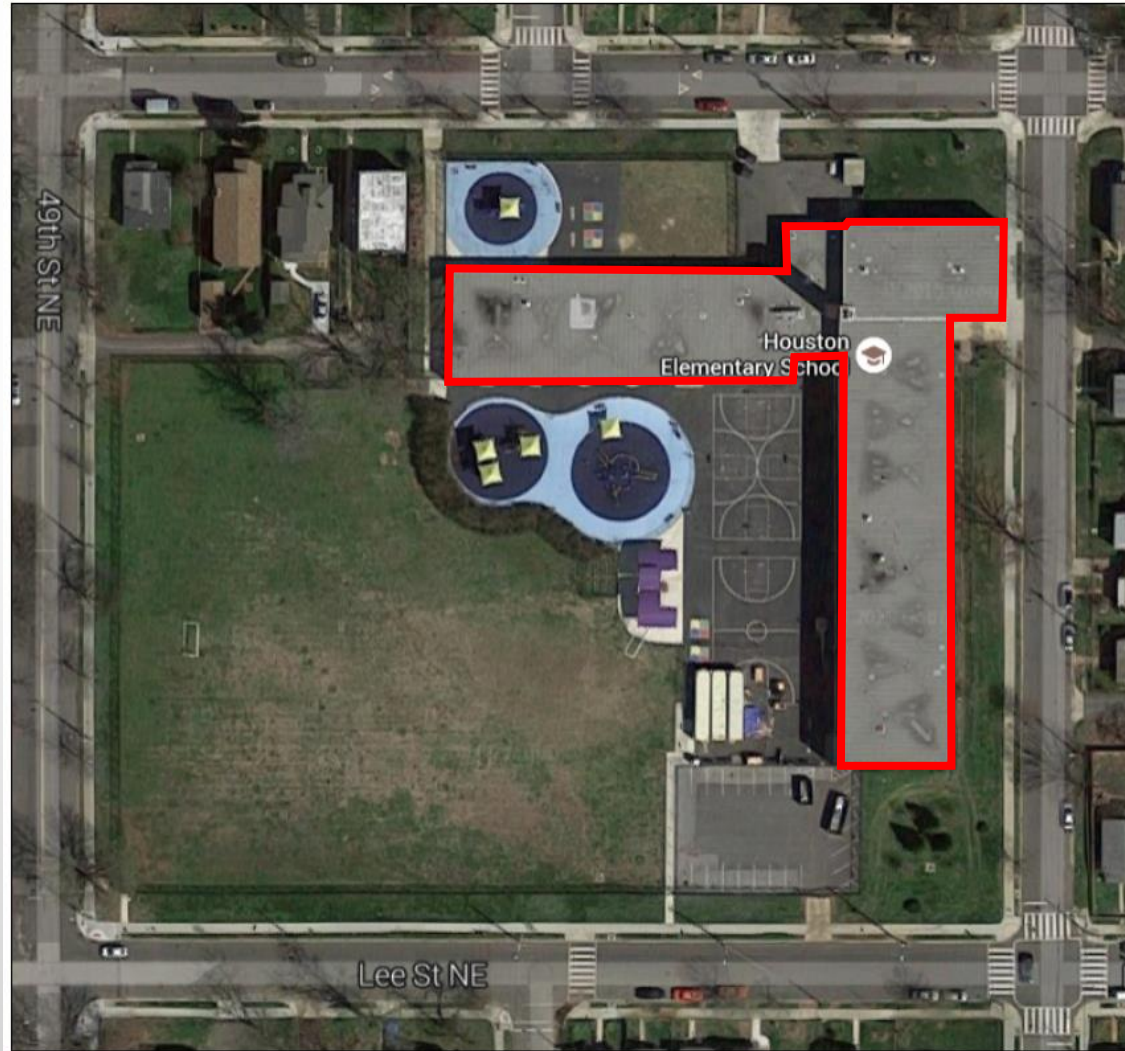
Example #1

1150 50th PI NE

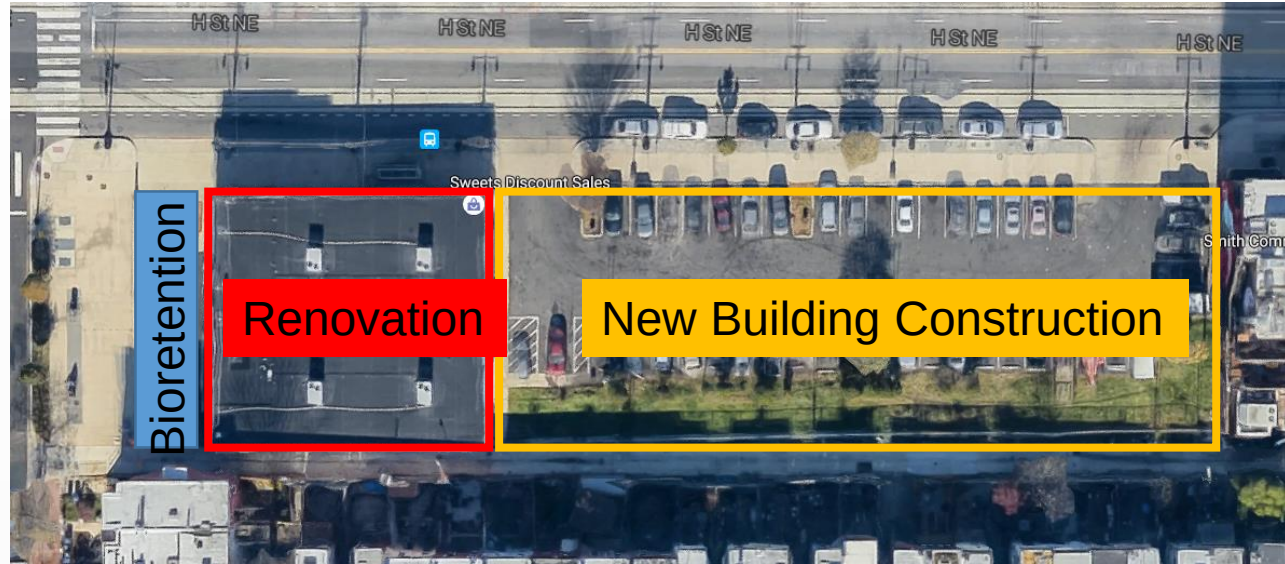
Renovation planned for
interior of entire building

Building area: 37,250
square feet

SWRv = 2,359 ft³ or
17,646 gal



Example #2



1207 H St NE

Renovate existing building and construct new building in parking lot

Property area: 23,220 square feet

Proposed renovated building area: 4,225 square feet

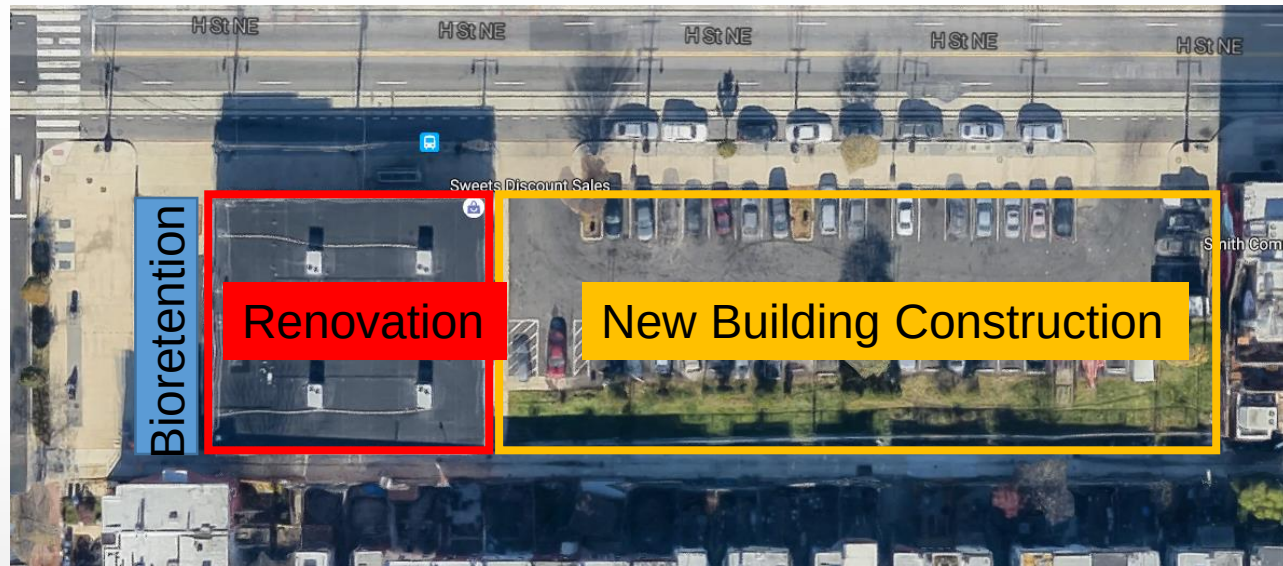
Proposed bioretention area: 3,795 square feet

Proposed new building area: 15,200 square feet

SWRv = ?

$$SWRv(cf) = \frac{P}{12 \text{ in/ft}} \times [0.95 \times (\text{Impervious Area}) + 0.25 \times (\text{Compacted Area})]$$

Example #2



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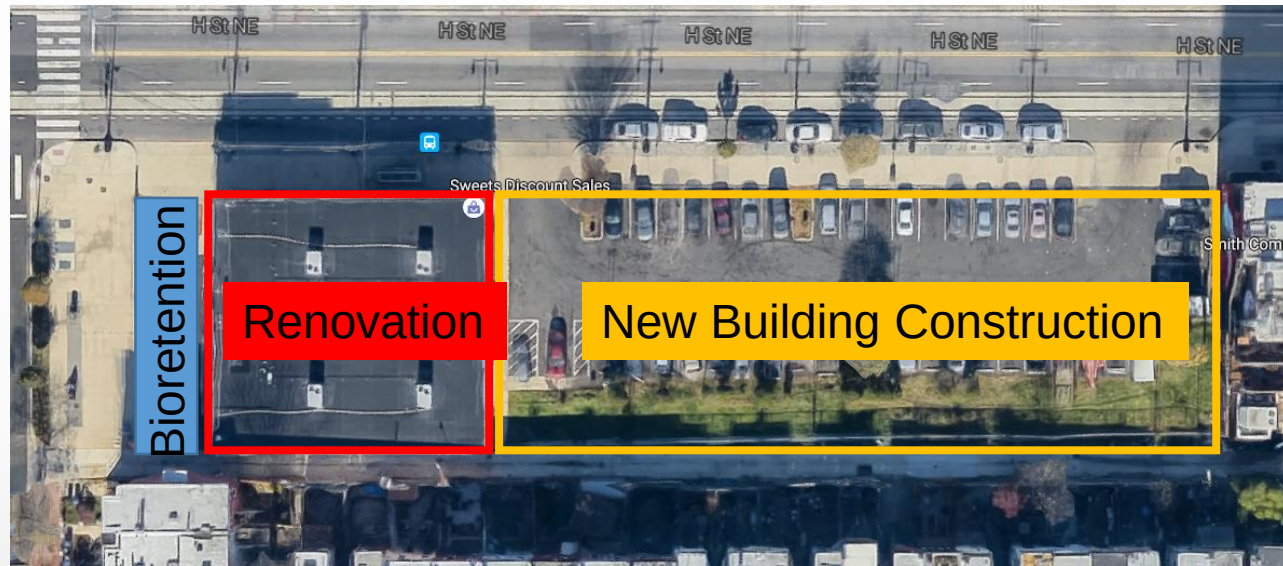
Proposed bioretention area: 3,795 square feet

Proposed new building area: 15,200 square feet

SWRv = ?

$$SWRv(cf) = \frac{0.8 \text{ in}}{12 \text{ in/ft}} \times (0.95 \times 4,225 \text{ ft}^2) + \frac{1.2 \text{ in}}{12 \text{ in/ft}} \times [0.95 \times (3,795 \text{ ft}^2 + 15,200 \text{ ft}^2)]$$

Example #2



1207 H St NE

Renovate existing building and construct new building in parking lot

Property area: 23,220 square feet

Proposed renovated building area: 4,225 square feet

Proposed bioretention area: 3,795 square feet

Proposed new building area: 15,200 square feet

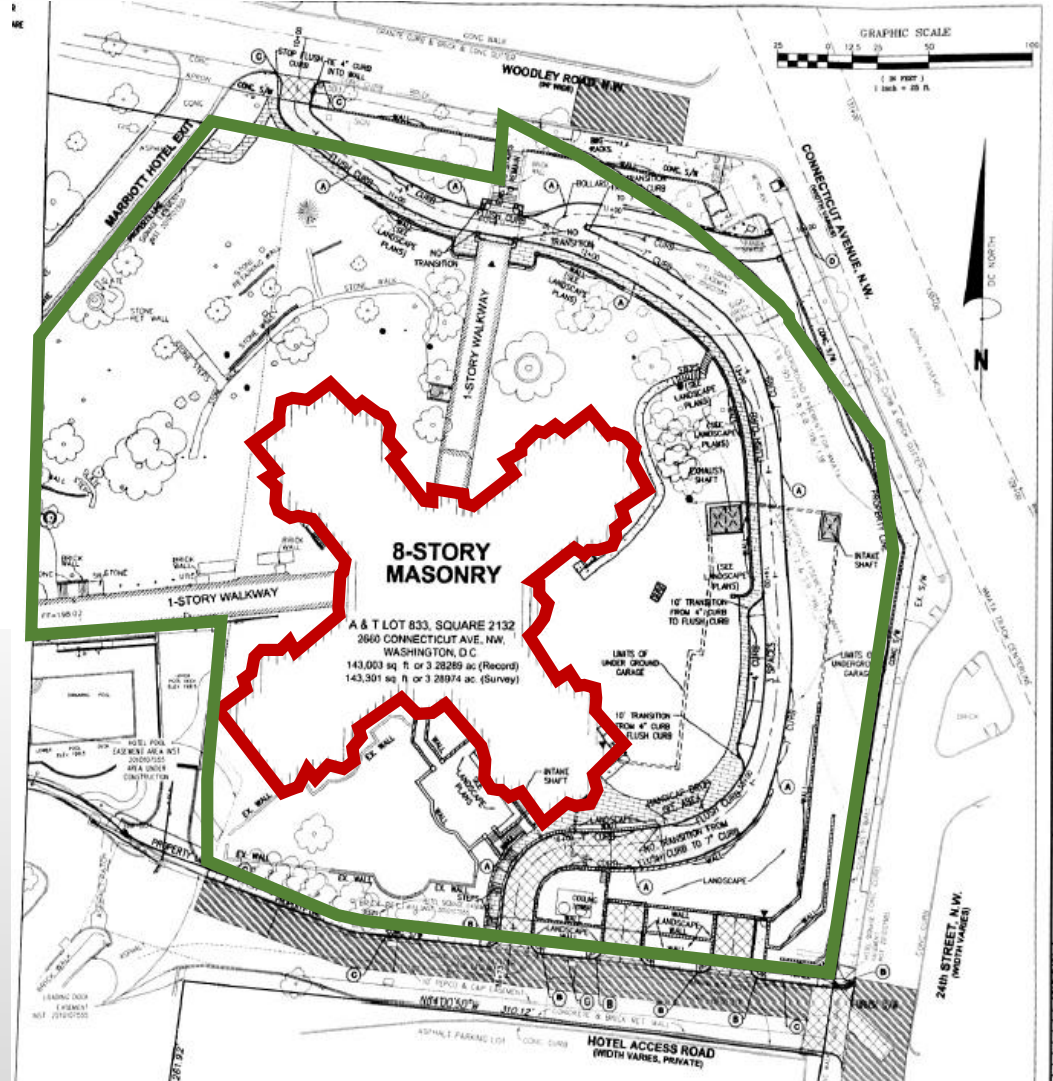
SWRv = 2,072 ft³ or 15,499 gal

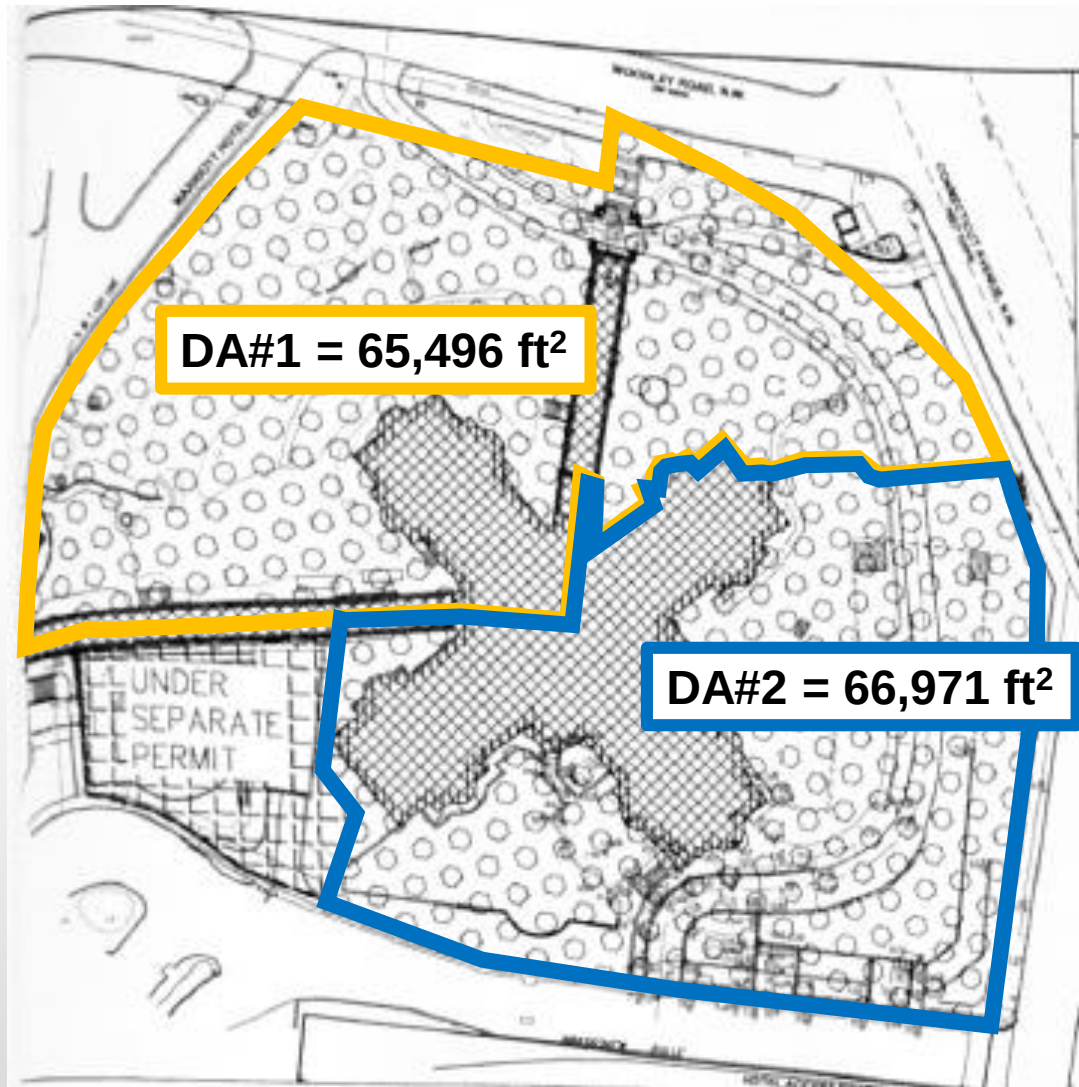
Site Drainage Areas (SDAs)

vs.

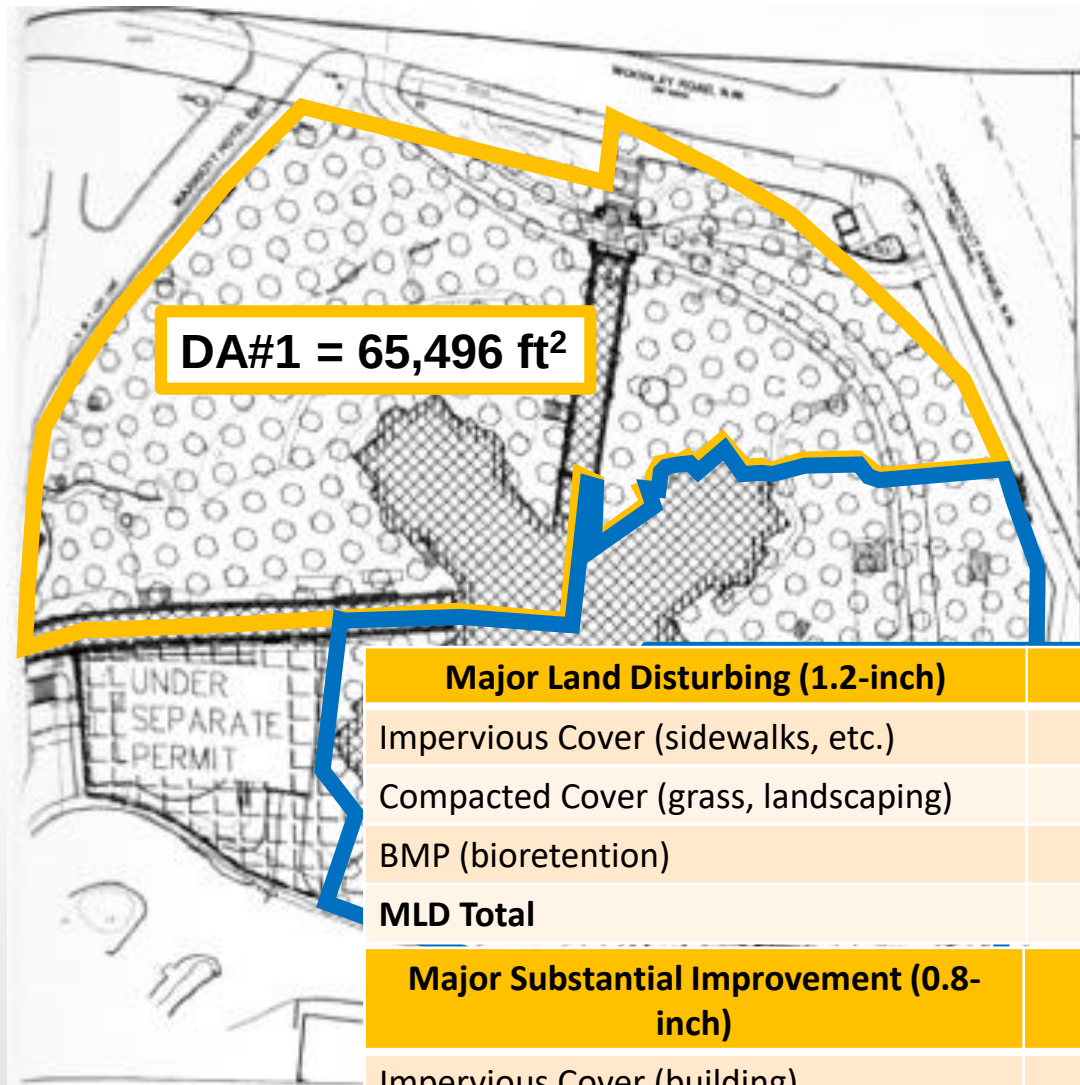
Contributing Drainage Areas (CDAs)

- Land Area = Major Land Disturbing (1.2")





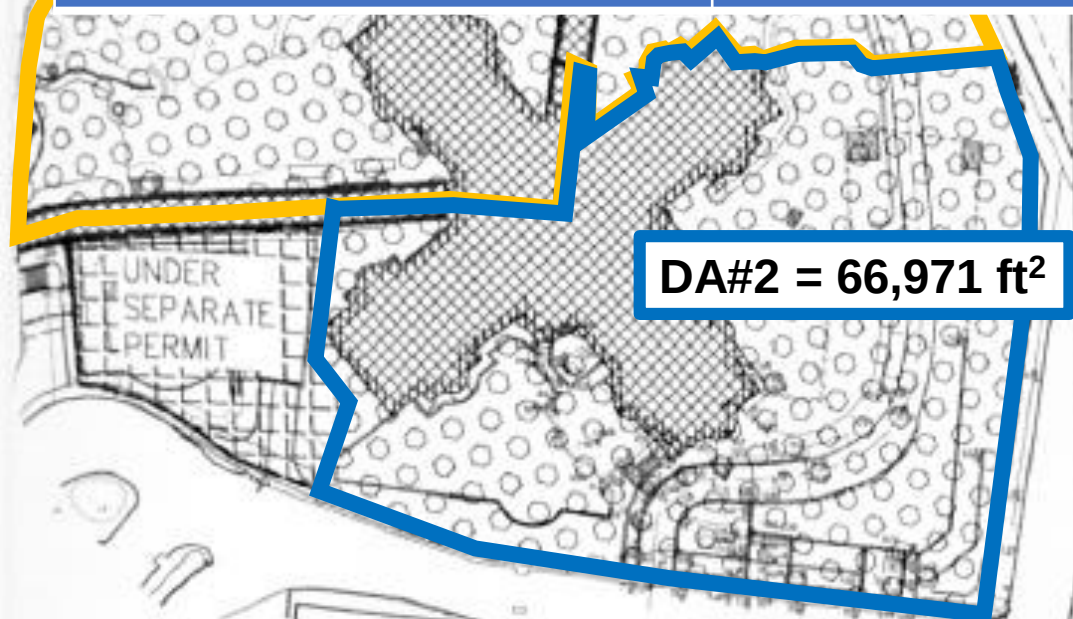
Site Drainage Areas



Site Drainage Area #1

Major Land Disturbing (1.2-inch)	Land Area (ft ²)	Rv	SWRv (ft ³)
Impervious Cover (sidewalks, etc.)	11,197	0.95	1,064
Compacted Cover (grass, landscaping)	43,685	0.25	1,092
BMP (bioretention)	1,489	0.95	141
MLD Total			2,297
Major Substantial Improvement (0.8-inch)	Land Area (ft ²)	Rv	SWRv (ft ³)
Impervious Cover (building)	9,125	0.95	578
Total	65,496		2,875

Major Land Disturbing (1.2-inch)	Land Area (ft ²)	Rv	SWRv (ft ³)
Impervious Cover (sidewalks, etc.)	11,704	0.95	1,112
Compacted Cover (grass, landscaping)	27,289	0.25	682
BMP (bioretention, green roof)	9,878	0.95	938
MLD Total			2,732
Major Substantial Improvement (0.8-inch)	Land Area (ft ²)	Rv	SWRv (ft ³)
Impervious Cover (building)	18,100	0.95	1,146
Total	66,971		3,878



Site Drainage Area #2

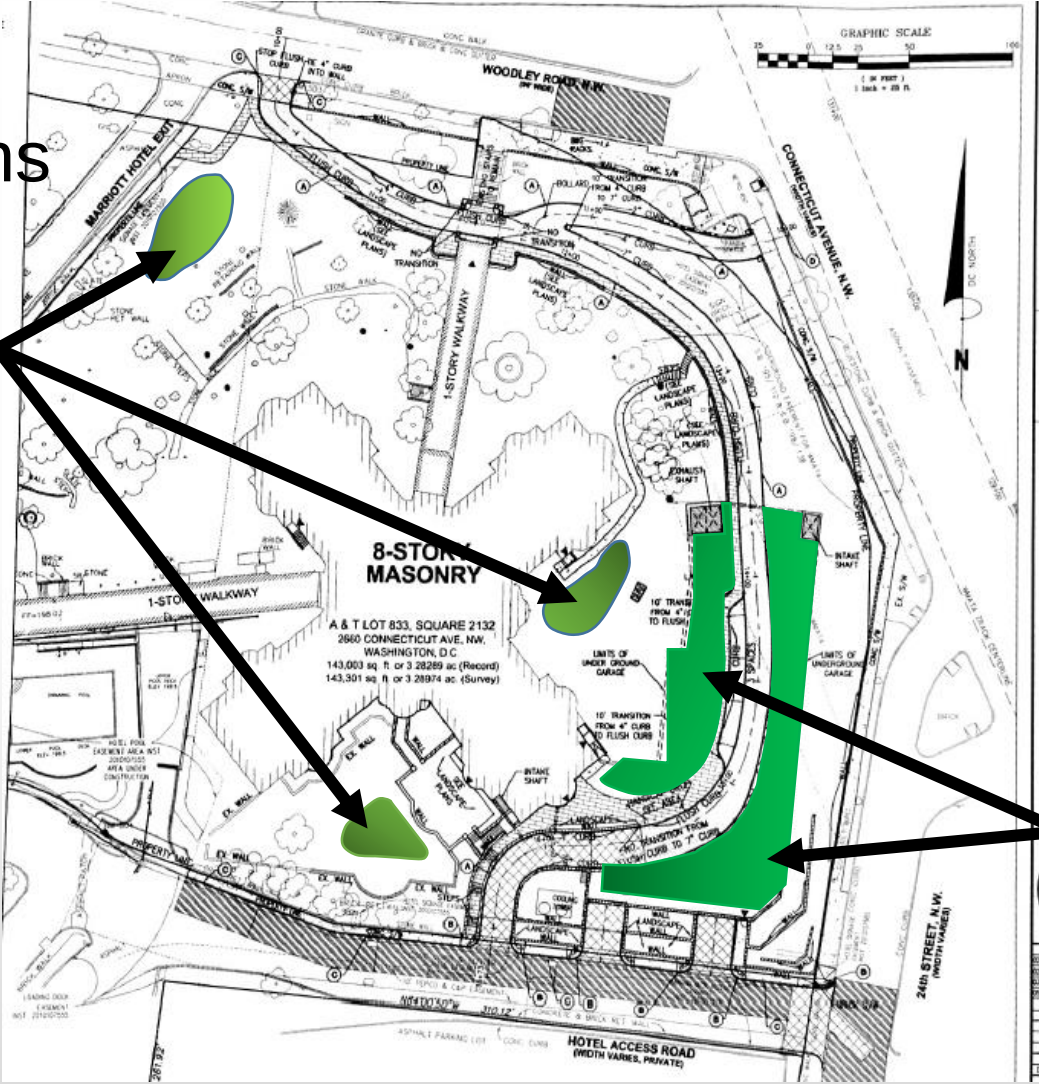
Total SWRv for Site

Site Drainage Area #1	2,875 ft ³
Site Drainage Area #2	3,878 ft ³

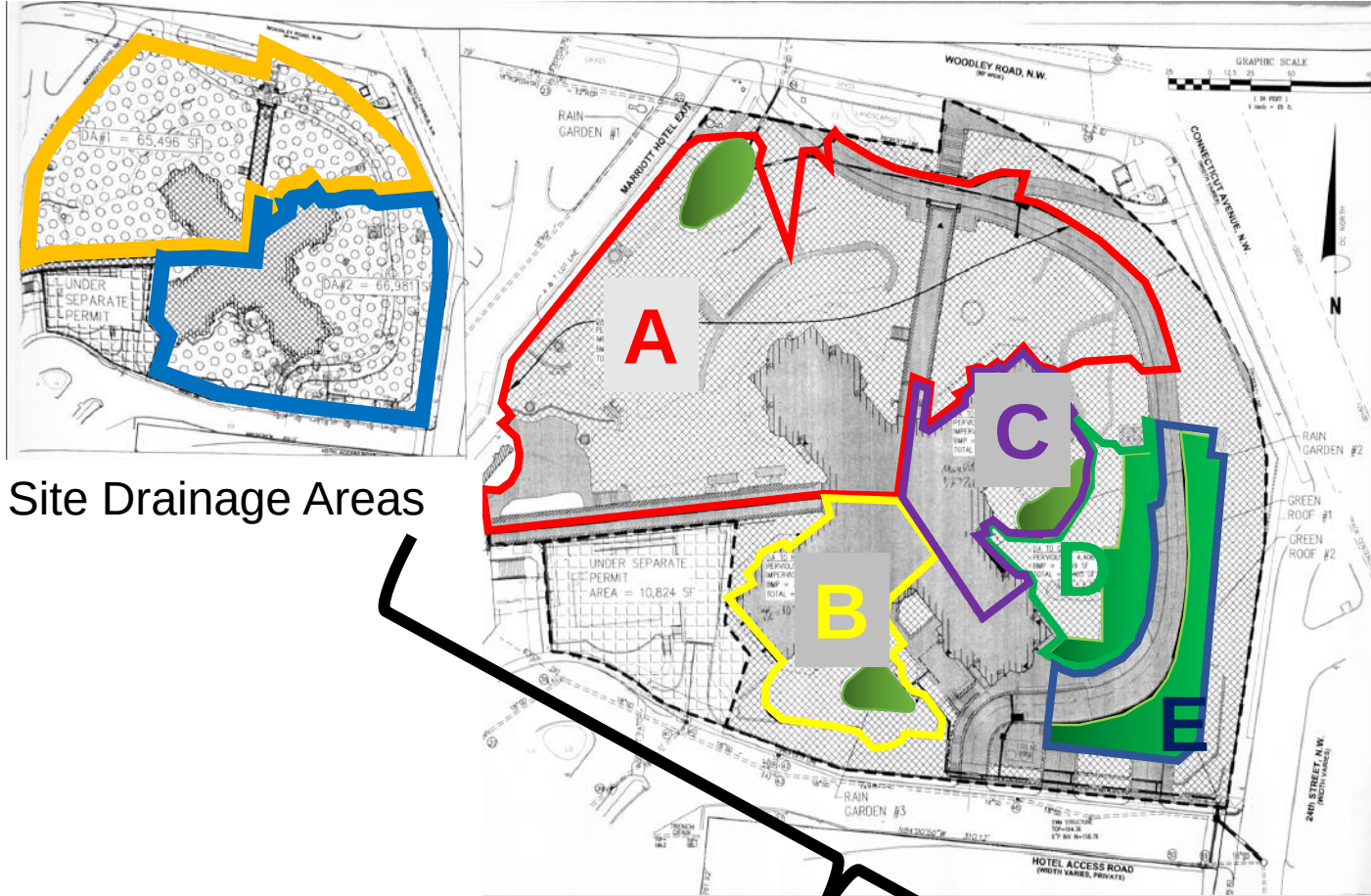
Total = 6,753

BMP Locations

Bioretention

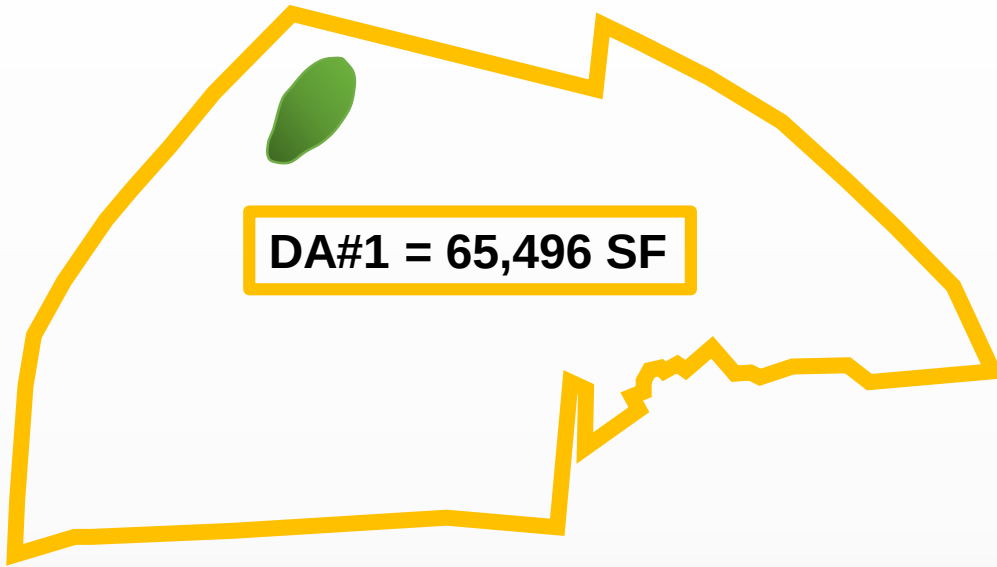


Green Roof



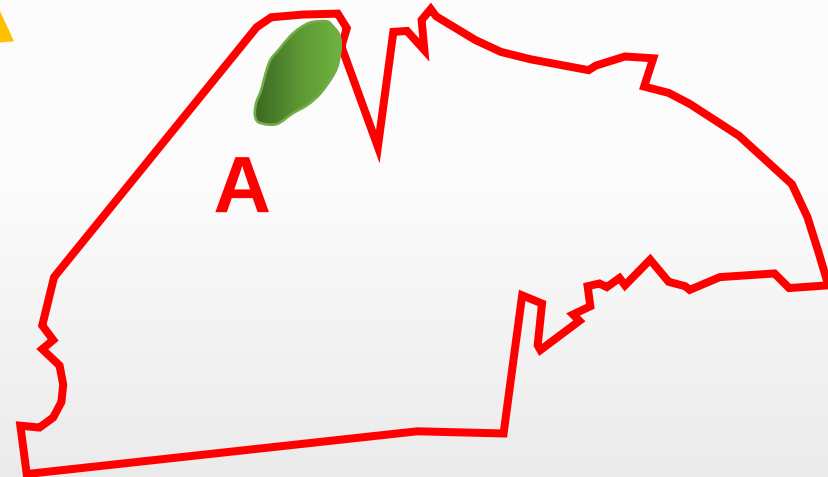
Site Drainage Areas

Contributing Drainage Areas

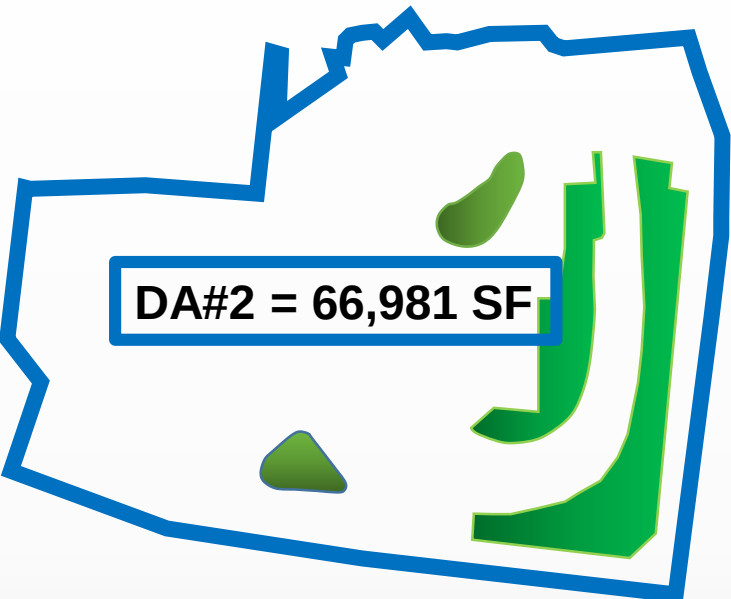


SDA #1 SWRv (1.2-inch) = 2,875 ft³

Land Cover Type	CDA Area (ft ²)	Rv	Max. Retention Vol. (ft ³) (1.7-in)
Impervious Cover	18,067	0.95	2,432
Compacted Cover	36,566	0.25	1,295
BMP	1,489	0.95	200
Total	56,122		3,927

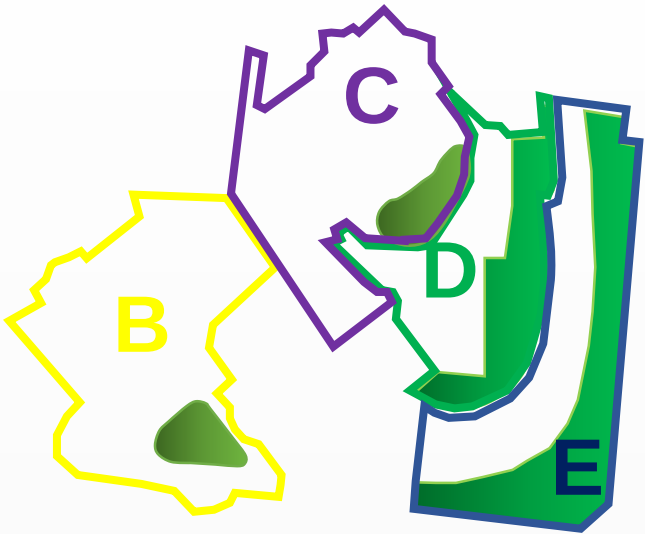


Retention Volume Bioretention	2,576 ft³
Actual Retention Value	2,576 ft³



DA#2 = 66,981 SF

SDA #2 SWRv (1.2-inch) = 3,878 ft³



BMP	Max. Retention Vol. (ft ³) (1.7-inch)	BMP Retention Volume (ft ³)
B	997	1,047
C	1,314	1,402
D	923	859
E	1,241	1,157
Total	4,475	4,465

Retention Value 4,327 ft³

Total SWRv for Site

Site Drainage Area #1	2,875 ft ³
Site Drainage Area #2	3,878 ft ³

Total = 6,753

Maximum Retention Volume BMP A	2,576 ft ³
Maximum Retention Volume BMPs B - E	4,327 ft ³

Total = 6,903

Met their stormwater obligation!